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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/909,394	07/19/2001	Gang Huang	HUANG 11-1-10	9912
47396	7590	05/05/2005	EXAMINER	
HITT GAINES, PC AGERE SYSTEMS INC. PO BOX 832570 RICHARDSON, TX 75083			PATHAK, SUDHANSHU C	
			ART UNIT	PAPER NUMBER
			2634	

DATE MAILED: 05/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/909,394

Applicant(s)

HUANG ET AL. 

Examiner

Sudhanshu C. Pathak

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on February 24<sup>th</sup>, 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on February 24<sup>th</sup>, 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

### DETAILED ACTION

1. Claims 1-to-21 are pending in the application.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-7 (system), 8-14 (method) are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant Admitted Prior Art (AAPA) in view of Turner et al. (4,562,425) in further view of Rappaport ("Principles and Practice"; Prentice Hall PTR; 1996; Pages 270-272) in further view of Alelyunas et al. (6,553,087).

Regarding to Claims 1-14, The Applicant Admitted Prior Art (AAPA) discloses a communication system comprising a zero-amplitude symbol constitutes an end-of-file symbol or separate subframes according to a Home Phoneline Networking Alliance (HomePNA) standard using quadrature amplitude modulation (QAM) technique to more efficiently transfer the information across the network (Specification, Page 1, Paragraph 2, lines 1-10 & Specification, Page 2, Paragraphs 3-4). However, the AAPA does not disclose a QAM constellation comprising a zero amplitude symbol and further an amplitude detector that extracts a candidate symbol from said signal and locates said candidate symbol relative to constellation of symbols; and zero-amplitude symbol interpreter, associated with said amplitude detector, that recognizes said candidate symbol as being a zero-amplitude symbol

when said candidate symbol is closer to an origin of said constellation than to symbols proximate thereto.

Turner discloses a system of transmitting data through a communication channels implementing a QAM modulation techniques (Column 1, lines 45-68 & Column 2, lines 31-60 & Column 3, lines 60-68 & Fig.'s 1-3, 16). Turner also discloses a QAM constellation comprising a zero amplitude symbol (Column 4, lines 55-68 & Column 5, lines 1-20, 39-56 & Fig.'s 4-5, 8, 14-15). Turner also discloses the constellation is arranged on a Cartesian plane (Fig. 1-4). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Turner teaches implementing a QAM comprising a zero-amplitude symbol at the origin of the constellation, and this can be implemented in the system as described in the AAPA so as to represent a certain specified information according to the HomePNA standard as further described in the AAPA, thus satisfying the limitation of the claims. Furthermore, it is known to one of ordinary skill in the art at the time of the invention that a 16-QAM constellation is arranged on a Cartesian plane. However, the AAPA in view of Turner does not disclose an amplitude detector that extracts a candidate symbol from said signal and locates said candidate symbol relative to constellation of symbols; and zero-amplitude symbol interpreter, associated with said amplitude detector, that recognizes said candidate symbol as being a zero-amplitude symbol when said candidate symbol is closer to an origin of said constellation than to symbols proximate thereto.

Rappaport discloses QAM signal to include a combination of amplitude modulation and phase modulation (Page 270, Sec. 5.9.2, Eq. 5.120). Rappaport also discloses each point on the constellation in QAM to be an integral multiple of the minimum energy required for transmission (Page 270, Sec. 5.9.2, elements " $E_{min}$ ", " $a_i$ ", " $b_i$ " & Page 271, Eq. 5.123). Rappaport also discloses the phase modulation in a QAM to be portioned into sine and cosine functions (Page 271, Eq. 5.121, 5.122). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Rappaport teaches decoding the received QAM signal by determining the amplitude of the in-phase and quadrature components. However, the AAPA in view of Turner in further view of Rappaport does not specify decoding the QAM signal.

Alelyunas discloses demodulation of communications signals for a packet data receiver (Column 1, lines 15-20, 50-63). Alelyunas also discloses the receiver to include a slicer, that chooses from set of possible valid receivable levels which most closely matches the current received signal level and a decoder that converts this selected constellation point to a set of bits in a bit stream (Column 3, lines 25-45 & Fig. 2, elements 220, 222). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Alelyunas teaches mapping the received signals on an known constellation in the slicer and selecting the constellation point most close to the received signal level and further converting the selected constellation point into a set of bits, this can be implemented in the system as described in the AAPA in view of Turner in further view of Rappaport so as to

Art Unit: 2634

determine the zero amplitude symbol and further this symbol is converted into a bits stream which is interpreted as "end-of-file" or "end-of-subframe" in the HomePNA standard.

4. Claims 15-21 (receiver) are rejected under 35 U.S.C. 103(a) as being unpatentable over Alelyunas et al. (6,553,087) in view of Rappaport ("Principles and Practice"; Prentice Hall PTR; 1996; Pages 270-272) in further view of the Applicant Admitted Prior Art (AAPA) in further view of Turner et al. (4,562,425).

Regarding to claims 15-21, Alelyunas discloses a digital receiver comprising an A/D converter that converts a received signal analog form to digital form (Fig. 2, element 214); a demodulator, coupled to said A/D converter, that demodulates said digital signal (Fig. 2, element 216); an equalizer, coupled to said demodulator, that equalizes said digital signal (Fig. 2, element 218); a slicer, coupled to said equalizer, that recognizes and chooses from a set of possible valid receivable levels a level, or "point", which most closely matches the current received signal level (Fig. 2, element 220); and a decoder converts this selected point to a set of bits in a bit stream depending on the protocol (inverse of the encoder) (Fig. 2, element 222). Alelyunas also discloses implementing the receiver in a HPNA (Home Phoneline Network Alliance) standard (Column 1, lines 48-65). Alelyunas also discloses the receiver to include a slicer, that chooses from set of possible valid receivable levels which most closely matches the current received signal level and a decoder that converts this selected constellation point to a set of bits in a bit stream (Column 3, lines 25-45 &

Fig. 2, elements 220, 222). However, the Alelyunas does not disclose an amplitude detector.

Rappaport discloses QAM signal to include a combination of amplitude modulation and phase modulation (Page 270, Sec. 5.9.2, Eq. 5.120). Rappaport also discloses each point on the constellation in QAM to be an integral multiple of the minimum energy required for transmission (Page 270, Sec. 5.9.2, elements " $E_{min}$ ", " $a_i$ ", " $b_i$ " & Page 271, Eq. 5.123). Rappaport also discloses the phase modulation in a QAM to be portioned into sine and cosine functions (Page 271, Eq. 5.121, 5.122). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that to decode the QAM requires amplitude detection of the in-phase and quadrature components, and this can be implemented in the receiver prior to the slicer so as to determine the corresponding point on the constellation depending on the received signal. However, Alelyunas in view of Rappaport does not disclose transmitting/receiving a QAM signal further comprising a zero-amplitude symbol so as to represent an "end-of-file" or for separating subframes according to the "HPNA" standard, and further a decoder for a zero amplitude symbol.

The Applicant Admitted Prior Art (AAPA) discloses a communication system comprising a zero-amplitude symbol constitutes an end-of-file symbol or separate subframes according to a Home Phoneline Networking Alliance standard using quadrature amplitude modulation (QAM) technique to more efficiently transfer the information across the network (Specification, Page 1, Paragraph 2, lines 1-10 &

Specification, Page 2, Paragraphs 3-4). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention that the AAPA teaches "HPNA" standard to have a symbol to represent an "end-of-file" or an "end-of-subframe" condition, and this can be transmitted in the transceiver as describe in Alelyunas in view of Rappaport. However, Alelyunas in view of Rappaport in further view of AAPA does not disclose a QAM constellation comprising a zero amplitude symbol.

Turner discloses a system of transmitting data through a communication channels implementing a QAM modulation techniques (Column 1, lines 45-68 & Column 2, lines 31-60 & Column 3, lines 60-68 & Fig.'s 1-3, 16). Turner also discloses a QAM constellation comprising a zero amplitude symbol (Column 4, lines 55-68 & Column 5, lines 1-20, 39-56 & Fig.'s 4-5, 8, 14-15). Turner also discloses the constellation is arranged on a Cartesian plane (Fig. 1-4). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Turner teaches implementing a QAM comprising a zero-amplitude symbol at the origin of the constellation, and this can be implemented in the system as described in Alelyunas in view of Rappaport in further view of AAPA so as to represent a certain specified information according to the HomePNA standard as further described in the Alelyunas in view of Rappaport in further view AAPA, thus satisfying the limitation of the claims. Furthermore, it is known to one of ordinary skill in the art at the time of the invention that a 16-QAM constellation is arranged on a Cartesian plane.



***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, it is recommended to the applicant to amend all the claims so as to be patentable over the cited prior art of record. A detailed list of pertinent references is included with this Office Action (See Attached "Notice of References Cited" (PTO-892)).
6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sudhanshu C. Pathak whose telephone number is (571)-272-3038. The examiner can normally be reached on M-F: 9am-6pm.
- If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571)-272-3056
  - The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.
  - Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sudhanshu C. Pathak

Art Unit: 2634



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